

(A) Mission and Vision (one page limit)

Long-term vision and purpose. VISION: The South Metro-Salem STEM Partnership (SMS Partnership) catalyzes Oregon students to achieve STEM degrees and certificates, and reach Oregon’s education goals by increasing the access, excitement and engagement of students in STEM courses and experiential learning. MISSION (Purpose): The SMS Partnership will collectively optimize PK-20 STEM education by utilizing a full spectrum of public and private resources and model instructional practices to develop a career-ready, diverse, and adaptable workforce that enhances the regional economy and community.

Why partnership is critical. Local school districts have many exceptional STEM practices, but lack cross-district, cross-sector collaboration that can be activated by a Hub. One of the biggest issues reported by superintendents is the inability to reach all children in their districts with STEM contextualized learning experiences that lead to higher student achievement in STEM. The SMS Partnership agreed to engage in three promising strategies to meet this community need: STEM NETwork, STEM Learning Community, and Accelerated Credit.

Desired changes as a result of collaboration. South Metro-Salem schools will have: (1) Contextualized, project-based learning, connecting academics to advanced application, enabled through teachers coaching students as they learn; (2) STEM content and courses to increase exposure to STEM careers with contextualized learning delivered at all education levels; (3) Engaged teachers who are supported by active community and industry partners in and outside the classroom; (4) Technology, science, mathematics, and engineering design integrated so that students understand and use core principles; and (5) Multiple options for students to succeed in college-level STEM courses while in high school. Outcomes are connected to Achievement Compacts, Common Core State Standards (CCSS), and align with Oregon’s education strategy.

(B) Community Demographics and Needs Analysis. Geographic region, communities

served. The SMS Partnership serves a large and diverse geographic region south of the Portland metropolitan area along Interstate 5, including 15 school districts from Tigard-Tualatin in the north to Salem-Keizer and Dallas in the south. It contains urban and rural districts. Amity, with single elementary, middle and high schools is one of the smallest, located in a town of 2,800 people. West Linn-Wilsonville and Salem-Keizer serve thousands of students. This geographic mix means that the SMS Partnership must develop strategies that work for rural and urban areas, and can readily be replicated throughout Oregon.

The SMS Partnership districts reach 126,000 students and 5,899 teachers, representing 25% of Oregon’s enrolled students. This area is diverse. Based on ODE district report cards, half of students (50%) are economically disadvantaged. An estimated 22% of students are English language learners, and at least 55 different languages are spoken. More than 37% of students are students of color, mostly identifying as Hispanic/Latino (27% of all students).

STEM needs and challenges. The SMS STEM Partnership has identified STEM needs/challenges through convening meetings with community partners, interviews of district Superintendents, and an inventory of regional community assets and needs. Although the area has a richness of STEM resources, challenges include lack of cross-district, cross-sector collaboration to tap into those resources, and ensuring that all students have equitable opportunities. Many districts lack resources; for example the Dallas School District notes that **“As a medium-sized district in a rural area, we have struggled to find new and innovative ways to implement STEM.** Being part of a collaborative partnership will allow us to work with others in a bigger way and bring back what will work for our school district.” Several participating school districts have very high proportions of students who do not meet state Math

and Science standards, such as **70% of 5th grade students not meeting science standards** (Woodburn SD). The average among districts is that approximately 1/3 of students do not meet standards at every level (*see Appendix, item I*).

(C) Goals and Outcomes. **Goal:** By 2025, the SMS STEM Partnership will increase science and math achievement among students in partner districts and targeted schools. **Outcomes:**

1) By 2025, increase the percentage of the region’s 4th, 8th, and 12th graders that are “proficient” and “advanced” in math as measured by the Smarter Balanced assessment.

2) By 2025, increase the number of STEM college graduates that matriculate from partner district schools.

3) Increase STEM participation, persistence, and achievement based on ethnic/cultural and/or socioeconomic background, limited English language proficiency, gender, or disability.

4) Improve Oregon business and industry access to an Oregon-educated STEM talent pool that is highly skilled, motivated and globally competitive.

The SMS STEM Hub is working toward systemic, sustainable STEM practices in all 15 districts.

Shared Measures: Shared measures focus on hours per week of science instruction, students taking STEM courses including advanced courses, and participation in voluntary STEM activities. *Please see Appendix item II.* All shared measures will be tracked for all students at the district level, and collected by socioeconomic factors: economically disadvantaged, limited English proficient, students with disabilities, race/ethnicity, TAG, and girls.

Equity. The project will increase equity, help to close the achievement gap and further 40/40/20 goals. To assure that all students, of every background, are able to gain STEM skills, data will be tracked by socioeconomic factors as listed above. This will allow for comparison of

achievement between programs and among groups, to identify strategies and programs that may be particularly effective (or ineffective) for a group, and replication of effective strategies. Specific strategies also include an equity focus, such as weaving Pacific University's STEM ELL work into the STEM Learning Community, and utilizing MESA's expertise in equity outreach in Accelerated Credit materials and events.

Interim indicators. Interim indicators are as follows:

Professional Learning Community: (1) Number of teachers participating in STEM professional development (as defined by learning community framework; (2) Number of teachers who have changed practices: STEM curriculum or project-based learning.

STEM NETwork: (1) System for matching business and community-based contextualized experiences with students in classrooms; (2) Number of teachers, businesses, and community partners using system, and number of experiences listed in system.

Accelerated Credit: (1) Number of college-going incentives: scholarships, preferential admissions; (2) Number of dual or accelerated STEM credits among students in partner districts.

The shared measures and indicators will be fine-tuned with the assistance of an evaluator, to ensure that they are aligned with the interventions and support the theory of change.

Direct beneficiaries of programs. The SMS Partnership activities annually benefit: 100 teachers and 45 counselors; 5,500 students (annual); 80 post-secondary faculty and at least 15 superintendents and 30 principals. Over time, the professional development and STEM planning and programs will impact all 126,000 students in 15 districts.

Progress to date. The SMS Partnership has been acting as a Hub since 2011. The Partnership has brought together critical partners, including 15 school districts, six institutions of higher education, seven STEM-focused nonprofits, and 10 active industry partners. The full

partnership meets quarterly, with monthly Executive Board meetings, and has three active strategic work groups. The SMS Partnership has developed a vision, mission, governance structure, core strategies, common measures, and strategic activities/work plans for each of the core strategies. Strategic activities have been launched, utilizing in-kind labor from all partners:

- **Collaborative work groups:** *(1) STEM Professional Learning Community:* developed a community framework and is collaborating with educators to share successful STEM teaching practices and results-oriented curriculum; *(2) STEM NETWORK:* raised money to hire a SMS STEM Network Director, developed plans for a technology platform to match community volunteers with student and teacher needs; *(3) Accelerated Credit:* completed a dual credit inventory and opportunity assessment among post-secondary institutions in the partnership.
- **Partner activities:** As a result of the SMS partnership, several districts are developing STEM Plans, sharing teaching strategies, and seeking to increase accelerated learning options.
- **Sustainability and Grants:** Developed grant proposals, leveraged funding, assessed alignment of SMS Partnership strategies with state strategic initiatives, and began collaborating with Portland Metro STEM and East Metro STEM. Funding has come from grants, in-kind contributions from all partners, and cash support from businesses and school districts.

(D) Strategies. Evidence-based promising approaches being used. The SMS Partnership is implementing three primary strategies. Each is described below, along with the evidence base. More detail regarding specific activities within each strategy are provided in the *Appendix as item III.*

1. STEM Learning Community: *Create a learning community of teachers and community partners to share effective instructional practices and integrate contextualized,*

experience-based teaching and learning methods. This strategy focuses on developing a common STEM framework among districts, identifying and sharing effective practices (including those already existing in the partnership districts), providing professional development through classes, coaching sessions and teacher visitations, assisting teachers and districts to “STEMify” lesson plans and align with CCSS, and develop district STEM plans (*see Appendix item III, as well as Appendix item VIII, SMS STEM PLC Framework and Model*).

Professional development activities will help achieve outcomes as it reaches to the core of STEM instruction, improving the ability of teachers to deliver effective STEM education. Teachers will increase knowledge of instructional practices in STEM, and have access to lesson plans, contextual learning opportunities, and other concrete resources. This strategy spans all 15 districts and promotes shared STEM practices among teachers within their districts. Professional development has a strong evidence base (*Appendix item VII Bibliography*).

2. STEM Network of mentors, programs and volunteers *that inspire students and sponsors to highlight the value of STEM activities, connect STEM out-of-school activities to the classroom, and utilize the region’s rich industry and community resources.* This focuses on providing a "STEM NET" platform to easily connect business and community resources to schools, teachers and students (platform will either be developed or modified from an existing structure). The Partnership will leverage existing resources, collaborating with the Business Education Compact, Oregon FIRST, Saturday Academy, Oregon ASK, and PDX STEM Hub for volunteer capacity to offer high-quality classroom experiences. It will also match teachers to business partners, eventually connecting community resources to schools, teachers and students at all education levels. Please see activities in *Appendix item III*. These activities will help achieve outcomes through increasing contextualized learning and opportunities for application. It

can help teachers align their curriculum to state-of-the-art business practices and give students a greater understanding of the real-world applications of classroom learning. The STEM Network will also help extend the school day through expanded out-of-school programs, including the forming of a new MESA chapter. Please see *Appendix item VII Bibliography*.

3. Accelerated Credit. *Expand collaborations between schools, colleges and universities to accelerate students through dual credits, advanced placement, and incentives to attract students into STEM degree paths.* This strategy focuses on increasing early access for students to college courses and credits in STEM fields, overcoming any barriers to accelerating credit, and innovating with providing credit and transitions for core-to-college math and science entry-level college classes. Please see detailed activities in *Appendix item III*. These activities will help achieve outcomes through increasing the number of students who are engaging in college-going activities related to STEM. Accelerated credit activities are a proven means of increasing graduation rates and college attendance for minority students, first generation college attenders and other under-represented populations. Please see *Appendix item VII Bibliography*.

Common Core, Oregon standards. Common Core and Next Generation Science Standards are designed to be relevant to real world problems, reflecting the knowledge and skills young people need to succeed in college and beyond. Most teachers develop strong skills in teaching STEM theory but have had limited exposure to the practice of these fields of study. All three SMS Partnership strategies bridge that gap by developing contextualized STEM practices and curriculum to be shared across districts, connecting students to business and community in and out of the classroom, and providing accelerated STEM learning opportunities to ensure college readiness. Integration of STEM employers, who impart “how learning is used in business,” will provide teachers with business-relevant materials tied to CCSS/NGSS.

Equity Lens principles. The SMS Partnership has an explicit goal to address the achievement gap and has intentionally reached out to include schools with high percentages of underrepresented students. Districts identified a need for activities to reach all students, which has led to an emphasis on in-school programming that complements out-of-school programs. Specific activities to reach underserved and underrepresented students include: **Professional Learning Community (PLC):** (a) Improve STEM education for all students in a school, (b) Integrate Pacific University’s research on technical competency for ELL students into the PLC, (c) Bring the equity lens and training into PLC. **STEM Network:** (a) Incorporate more partners with expertise in reaching underserved students, and funding, (b) Highly promote business connections for schools with high percentages of underserved students; (c) Bring in business partners as role models (e.g. women engineers, scientists of color). **Accelerated Credit:** (a) Utilize MESA and other partners to expand reach to underserved families, providing culturally-relevant information on opportunities and cost-saving, and removing barriers such as AP fees; (b) Increase offerings to allow access for more students, including underrepresented students. See Appendix X. Equity Lens Activities.

(E) Evaluation Plan. Logic Model. Please see Logic Model in *Appendix, item IV*. The underlying assumption is that long term outcomes for student achievement will be attained when teachers can help students apply what they learn and when students understand and can use core STEM principles (as a result of STEM Learning Community), community partners are fully engaged in connecting academics to application, and accelerated credit options encourage student college-going rates.

Evaluation Questions that support theory of change:

1. Has the formation of a STEM Hub increased dissemination of STEM practices, awareness of opportunities, and resources to support STEM learning for students in partner districts?
2. Has the development of a STEM learning community led to an increase in the number of teachers integrating the teaching of science, technology, engineering and math, incorporating contextualized learning in classrooms, and developing district STEM plans?
3. Have teachers and community partners utilized the STEM NETWORK to extend contextualized STEM teaching and learning resources into classroom instruction or to extend the school day, in alignment with the Common Core and NGSS?
4. Will expansion of accelerated credit outreach and course offerings, and increased bonds to post-secondary partners result in an increased college-going rate for all demographic groups?

Data collection and methodologies. The SMS Partnership will work with a professional evaluator. Student data will be collected to the extent possible through existing databases, including ODE data and National Student Clearinghouse data. As the ODE develops a State Longitudinal Data System to include P-20W (preschool – work), the SMS Partnership will seek to use this data to match student K-12 and postsecondary achievement. For interim measures, SMS Partnership will use school district data. Districts will be surveyed regarding teacher participation and number of teachers who have changed practices. Postsecondary institutions will be surveyed regarding college-going incentives and dual/accelerated credits in STEM courses.

Measures, reliability and validity. Measures to assess impact include the Interim Measures and Shared Measures listed above. Interim measures are focused on impact on educators and the community while shared measures are focused on student impact. These measures were developed by education, business and community partners. The SMS Partnership will work with a professional evaluator to develop the formal evaluation and data collection

methodologies, including qualitative, formative feedback (rubric-based assessments, interviews, surveys) to assure reliability and validity of data, and that the measures support the theory of change. The evaluation framework and hub performance measures will focus on access and success of under-served students in STEM courses and programs. Particular emphasis will be given to closing persistent achievement gaps and expanding college readiness programs for minority students so they are better prepared to enroll in STEM programs in college and succeed.

(F) Partnership and Community Assets. Community Leadership. The SMS Partnership is a collaborative of community leaders, with high levels of involvement over the past 18 months to launch the STEM Hub activities. Planning meetings regularly have more than 40 participants. Community leadership includes 11 industry partners and 9 community organizations, along with education partners (see List of Partners and *Appendix, item V*). Several of the organizations have a primary mission of reaching and serving underrepresented students. All partners are actively contributing resources to the project. **Community Assets leveraged.** The SMS Partnership leverages significant assets, above and beyond the required match, as described in *Appendix item V*. Industry partners leverage STEM expertise and funding, student experiences, and products specific to their business such as free software or materials for use in the classroom. Community partners leverage STEM expertise and funding, student experiences, and their relationships with industry. Schools and universities leverage their expertise in education, funding, and advanced credit. **Extent of programs available.** The South Metro-Salem area has STEM assets available as listed in *Appendix, item V*, and in the signed Partnership Agreements. Industry, Post-Secondary, and Community Partners in particular offer STEM programs that promote STEM education within the partnership.

(G) Governance and Backbone. STEM Hub operating and legal structure. Governance. The SMS Partnership Executive Advisory Board (EAB) provides policy direction, leadership, and oversight, with representation from K-12, postsecondary, business and community. The board meets monthly for updates on program implementation, program evaluation, continuous improvement and long-range planning. The full partnership and the strategy work groups meet at least quarterly. ***Partnership Agreements.*** The SMS STEM Partnership Agreement defines the participation of each core partner. ***Backbone organization.*** Oregon Tech serves as the backbone organization, with guidance from the EAB, and provides: (1) Stable leadership and direction, as a public university with the primary mission of STEM education; (2) Fiscal accountability, following the policies defined by the State of Oregon, OUS Internal Management Directives, and Oregon Tech; (3) Fundraising and sustainability, driven by the EAB, and fulfilled by the full SMS STEM Partnership; (4) Data collection; (5) Oversight of external evaluation. ***Leadership of Core Strategies:*** Each strategy has a work group with active partnership from all sectors.

1. For the STEM Learning Community, Salem-Keizer School District is the lead partner. SKSD will be a sub-awardee under the STEM HUB grant, to hire the Learning Community facilitator, and administer the teacher stipends and distribution of resources to districts.

2. For the STEM NETwork, Oregon Tech is the lead entity; the Oregon-NASA Space Grant Consortium, school districts, and business partners provide funding. Oregon Tech will provide a physical or virtual location for the STEM NETwork. Partners will promote the STEM NETwork, encourage business and community partner participation, and ensure sustainable funding.

3. The Accelerated Credit lead is shared by Oregon Tech and Clackamas Community College. All post-secondary partners work with school districts to increase dual credit options.

Process to create Partnership Plan. More than 40 partners met monthly over 18 months to create the partnership. All partners have edited and approved the SMS STEM definitions, Learning Community Framework, Measures of Success, and Business Plan.

Implementing Funding. The SMS STEM Hub will hire a HUB Director immediately, and initiate RFPs for data collection and evaluation, equity training and other subcontracts. Salem Keizer school district will be a subawardee for the learning community implementation and stipends. Oregon Tech will collaborate with TAO on STEM Network development, and implement the Accelerated Credit strategy in collaboration with all post-secondary partners, who will retain authority for their accelerated credit activities. Oregon Tech is able to efficiently and effectively manage funds using standard University fiscal procedures. Collaborating school districts and community partners will serve as fiscal agents for grants and philanthropic gifts that finance the STEM Learning Community and other SMS STEM collaborative strategies.

Process and performance indicators of partnership. These include: All districts participating in the STEM Learning Community; All districts and colleges providing data on the measures of success and outcomes; Feedback on effectiveness at end of all SMS Partnership meetings; Level of engagement at quarterly meetings; Informal feedback at social events and other venues; Willingness of all partners to contribute in-kind and cash to sustain the Plan.

(H) Sustainability plan. Sustainability. The SMS Partnership is focused on developing structures that will be sustainable, including changing instructional practice in schools (through professional development and district STEM plans), creating an ongoing system for matching STEM opportunities with students (STEM NETWORK), and institutionalizing additional accelerated credit options. The SMS Partnership will continue to seek additional revenues from

business partners and school district contributions; through grants and contracts; and working with business partners to develop a product or service that will generate revenue. Partners have demonstrated strong commitment to date, including matching funds for this proposal.

Communication. The STEM Learning Community is the key to keeping partners engaged. If teachers feel they are getting value, they will keep their superintendents involved and will engage in STEM Hub strategies (contextualized learning, STEM NETWORK business involvement, accelerated credit). The Quarterly Partner meetings provide additional opportunities to keep partners engaged and focused, and the STEM NETWORK is specifically designed to sustain involvement of the greater community.

Regional partnerships over time. The SMS Partnership will grow. There are several districts in our area that plan to join within the next two years. Business and community partner involvement is expected to increase dramatically as the STEM NETWORK begins to develop opportunities to connect with students. The Partnership will leverage learning from the new CTE grants that have been awarded to partner districts (*Appendix, item XI*). The SMS Partnership will increase connections with community-based service providers to further meet the needs of underrepresented students. Relationships with partners who are deeply integrated into the business plan, such as BEC (STEM Connect), Oregon ASK (Girls Collaborative Project), Saturday Academy ASE Program, and MESA (Math Engineering Science Achievement program for underrepresented students) will deepen over time, and demonstrate the full collective impact of the Hub. The major challenges will be sustaining district-level funding and momentum with so many other educational priorities. Another challenge is the varying sizes and socioeconomic characteristics of our districts. To operationalize a strategy in Amity is very different than in Salem-Keizer. These challenges can be mitigated by continuing to provide relevant and

accessible paths to student achievement in STEM that helps the districts meet the measures in their Achievement Compacts, and through the cross-district sharing in the learning community.

Advocacy and policy issues. The SMS Partnership sees several issues that could support long-term effectiveness including: sustained funding for STEM Hubs, building connections between urban/suburban and rural districts and statewide hubs; adopting some core strategies at the state level in order to put money behind evidence-based practices; and incentivizing adoption of curriculum and programs that show results.

Partnership Agreement and STEM Hub Organizations. Please see Agreement.

(I) Participation in the Statewide STEM Hub Network. Expertise and Benefit. The SMS Partnership can contribute expertise in the STEM NETWORK platform, best practices in STEM Learning Community, effective practices for closing the achievement gap, and strategies for accelerated credit. The Partnership would like to benefit from other Hub's expertise in mentoring, teacher professional development, utilization of out-of-school expertise, and equity lens training. Please see the *Appendix, item VI*, for detail. **Relationship to other regional efforts.** SMS has reached out to the Southern Oregon ESD about forming a Southern Oregon STEM Hub, and has met with both the Portland Metro STEM Partnership and East Metro STEM regarding collaboration. Many SMS community partners are also supporting other hubs, and have helped form the STEM Council and the STEM Employer Coalition. SMS delivered a presentation at the 2013 CTE Conference on how to form a STEM Partnership, and has shared all organizational information with other groups around the state. Everything that SMS has developed is considered "shareware," copyright-free for public use. The vision is to create opportunities for every student in Oregon, with a focus on region-level action: www.oit.edu/stem.